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Autopsy and Anatomic Pathology
Clinical Pathology and Toxicology
Forensic Pathology

Neuropathology
Epidemiology
Medico-Legal Consultations

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May 31, 2022

Dear Ms. Kennedy,

Re: Charles Lorentz, Deceased
Medico-Legal Report

Summary of Education, Training and Experience
I completed medical school in 1990 at the University of Nigeria, Enugu, Nigeria. Upon graduating from medical school, I completed a one-year clinical housemanship at the University of Nigeria Teaching Hospital in the fields of pediatrics, internal medicine, general surgery, obstetrics, and gynecology. After housemanship, I worked as an emergency room physician at a university hospital in Nigeria for approximately three years. I sat for and passed my United States Medical Licensing Examinations [USMLE] while I worked as an emergency room physician. I came to the United States in 1994 through a World Health Organization scholarship to become a visiting research scholar for eight months at the Department of Epidemiology, Graduate School of Public Health, University of Washington, Seattle, Washington.

In 1995, I proceeded to the College of Physicians and Surgeons of Columbia University, New York, New York, at Harlem Hospital Center, to complete residency training in Anatomic Pathology and Clinical Pathology. In 1999 I proceeded to the University of Pittsburgh, Pittsburgh, Pennsylvania to complete residency training in forensic pathology and neuropathology. I hold four board-certifications in Anatomic Pathology, Clinical Pathology, Forensic Pathology and Neuropathology. I also hold a Masters in Public Health [MPH] degree in Epidemiology from the Graduate School of Public Health, University of Pittsburgh, Pittsburgh, Pennsylvania. I also hold a Masters in Business Administration [MBA] degree from the Tepper School of Business, Carnegie Mellon University, Pittsburgh, Pennsylvania, one of the leading business schools in the world. I am a Certified Physician Executive and an honorary fellow of the American Association of Physician Leadership [AAPL]. I also hold a fifth board-certification in medical management from the AAPL. I am licensed to practice medicine and surgery in four states in the United States namely Hawaii, California, Indiana, and Pennsylvania.

EXHIBIT 3

I am currently the President and Medical Director of Bennet Omalu Pathology [BOP], a California medico-legal consulting firm, and a Clinical Professor at the Department of Medical Pathology and Laboratory Medicine, University of California, Davis. In my capacity as the Medical Director of BOP, I am a consulting forensic pathologist and neuropathologist to many hospitals in central California and to several counties in northern California. There are less than a few dozen practicing forensic pathologists-neuropathologists in the United States who are board-certified in both forensic pathology and neuropathology.

For over nineteen years, I have been involved in over twelve thousand death and injury investigations in my career as a forensic pathologist and neuropathologist, which began in 1999. I have personally conducted and performed over ten thousand autopsies and death investigations and examined over eleven thousand brain tissue specimens. I also perform trauma pattern analysis in both living patients and deceased patients to determine causes and mechanisms of sustenance of injuries and death. I am also involved in the evaluation of living victims of all types of injuries and trauma, including but not limited to victims of assault, traumatic falls, industrial and accidental injuries, medical complications and misadventures, rape, child abuse and sports-related injuries. I have been consulted and retained as an expert witness in one to two thousand cases involving all types of medico-legal cases across all jurisdictions in the United States including federal, state, county and municipal courts and arbitration panels; in both civil and criminal cases, for the plaintiff, defense, district attorneys and public defenders. I have been involved as an expert witness in complex class action and industrial lawsuits involving thousands of individuals and major corporations.

My areas of interest and focus include brain patho-physiology, brain injuries and brain trauma, in both living and deceased patients. I identified Chronic Traumatic Encephalopathy [CTE] in a retired football player when I performed an autopsy and examined the brain of Mike Webster in 2002. Subsequently, I identified CTE in other high-impact, high-contact sports athletes and in military veterans suffering from Post-Traumatic Stress Disorder [PTSD]. Since 2002 CTE has received international attention from the sports industry, sports medicine, and neuroscience. My work has been featured extensively in all media platforms across the world. My work and life were featured in a major Hollywood film, “Concussion” released in December 2015 by Sony Motion Pictures, in which the renowned actor, Will Smith, played me as Dr. Omalu. Several New York Times best-selling books have also been published on my life and work including “The League of Denial” and “Concussion.” I have published several books including my memoir, “Truth Doesn’t Have a Side,” which was published in August 2017. My latest book, “Brain Damage in Contact Sports” was published in February 2018. I have published extensively in the medical and scientific literature authoring many scientific papers and book chapters.

I have received three honorary PhD degrees from two universities in the United States, and from the Royal College of Surgeons of Ireland in recognition of my work and expertise. I have also received numerous awards from across the world in recognition for my work and expertise in both living and deceased patients. I have received the “Distinguished Service Award” from the American Medical Association [AMA], which is the most prestigious award of the AMA. I have been honored by the United States Congress and I have appeared on multiple occasions before committees of the United States Congress and committees of State Legislatures across the Unites States advising them on matters relating to trauma. In 2019 and 2020 I was appointed to the Traumatic Brain Injury Board of the State of California to advise the state on matters relating to traumatic brain injuries.

Since 1999 I have testified as an expert witness in matters relating to all types of injuries and deaths in over 1000 court proceedings across the United States. I have attached a copy of my curriculum vitae, which enumerates my body of work and experience in greater detail. I have also attached my fee schedule. The cases I have testified in, beginning in 2009, are enumerated at the end of my curriculum vitae.

Pursuant upon your request, I have reviewed the materials sent to me in the case of Charles Lorentz, Deceased. A comprehensive list of the materials submitted to me for review, prepared by the attorneys, is attached to this report as Appendix A.

Brief Summary of Prevailing Forensic Scenario[1,2]
At the time of his death on March 21, 2020, Charles Lorentz was a 25-year-old White male who was born on August 31, 1994.

On March 21, 2020 Officer Robert Mitchell of the National Parks Service shot and killed Charles Lorentz at the Carlsbad Caverns National Parks, New Mexico.

As the video clips show, Officer Mitchell encountered Mr. Lorentz on a roadway at the park. Mr. Lorentz was not violent and was coherent. He answered the questions the officer asked him and obeyed the officer's instructions. When the officer asked him to turn around, he said no. The officer escalated the encounter and tased[3] Mr. Lorentz, he came closer to Mr. Lorentz to dry stun him, he initiated physical contact and an altercation ensued and Mr. Lorentz was brought to the ground when he shot him, first in the right thigh, and then in the chest, and killed him.

Mr. Lorentz was shot while he was on the ground, and after approximately 3.5 minutes after he was shot, Officer Mitchell hand-cuffed the dying and near-motionless Mr. Lorentz as he laid on the ground. He placed him prone on the ground with his wrists and hands cuffed behind his back. Officer Mitchell left Mr. Lorentz dying on the ground and did not provide any first aid or cardiopulmonary resuscitation [CPR] until after 12 minutes when he began rendering first aid by placing a breathing mask over his face. 14 minutes after he had shot Mr. Lorentz, Officer Mitchell began attending to his bleeding woods to control the bleeding, while Mr. Lorentz remained handcuffed.

Other Officers arrived at the scene 19 minutes after Mr. Lorentz was shot and began providing CPR to him. Mr. Lorentz was pronounced dead at the scene.

Autopsy
A full autopsy [2020-01904] was performed on the body of Charles Lorentz by Dr. Nicole Jackson, a forensic pathology fellow, and by Dr. Heather Jarrell, director of forensic neuropathology, and assistant professor of pathology. The autopsy was performed at the Office of the Medical Investigator, School of Medicine, the University of New Mexico, Albuquerque,

[1] This section of the report should not be used and is not intended to be used to establish the facts in this case.
[2] The video and body camera clips in part documented the prevailing terminal forensic scenario in this case.
[3] Apparently, no current was delivered.

New Mexico. The autopsy was performed on March 23, 2022 beginning at approximately 09:41 a.m. At autopsy Charles Lorentz weighed 79.80 kg, and measured 178 cm.

Dr. Jackson enumerated the following pathological diagnoses:

PATHOLOGIC DIAGNOSES:

I. Gunshot wound of chest
   A. Entrance: left chest, loose contact range of fire
   B. Lethal injuries: perforation of heart
   C. Projectile recovered from left back (225.4 GN)
   D. Trajectory: front to back, right to left, upward
II. Gunshot wound of thigh
   A. Entrance: right thigh, loose contact range of fire
   B. Associated Injuries: right femur fracture
   C. Projectile recovered from back of right thigh (137 GN)
   D. Trajectory: front to back, left to right, downward
III. Cerebral edema, brain weight = 1460 grams
IV. Accessory spleen

Th cause of death was determined to be Gunshot Wound of Chest, and the manner of death was determined to be a homicide.

The following evidence of trauma was observed on the body:

I. Gunshot Wound of the Left Chest [Bullet Recovered]

a. Gunshot wound of entrance[4]:

There was a 1.0 cm in diameter circular perforating wound in the left and medial anterior chest located 50 cm below the level of the top of the head, and 2.5 cm left of the anterior midline. There were approximately 1.0 cm in width circumferential red-pink marginal abrasions and soot deposits, accompanied by sparse circumferential red-pink stipple abrasions in the outer circumference of the soot deposits and marginal abrasions[5,6,7,8].

b. Pathway of the bullet:

The bullet perforated, contused and lacerated the skin and soft tissues of the left medial chest, perforated and fractured the anterior left 4th costal cartilage, perforated, contused and lacerated the anterior mediastinum and pericardium, perforated, contused and lacerated, through and through, the anterior right ventricle, interventricular septum and left ventricle, perforated, contused and lacerated the lateral left pericardium, perforated, contused and lacerated the medial left pleura, perforated, contused and lacerated the upper lobe of the left

[4] The autopsy report erroneously stated that there were no marginal soot deposits or powder stippling. This is patently false. The autopsy pictures vividly show circumferential marginal abrasions, soot deposits and stipple abrasions.
[5] Autopsy Image # 2020-01904202003231255520010 04
[6] Autopsy Image # 2020-01904202003231255520010 05
[7] Autopsy Image # 2020-01904202003231257140010 08
[8] Autopsy Image # 2020-01904202003231258030010 03

lung, through and through, perforated, contused and lacerated the left posterior parietal and visceral pleura, perforated and fractured the posterior left 6th rib, perforated, contused and lacerated the soft tissues in the scapular fossa of the left scapula, perforated and fractured the body of the scapula, perforated, contused and lacerated the soft tissues of the infraspinous fossa of the left scapula, perforated, contused and lacerated the soft tissues of the lateral left thoracic back, penetrated, contused and lacerated the subcutaneous tissues and skin of the lateral left thoracic back, before it came to settle in the subcutaneous tissue of the lateral left thoracic back.

Accompanying the track of the bullet are extensive soft tissues hemorrhages in the anterior mediastinum, transmural contusions and lacerations of the basal anterior right ventricle, interventricular septum and left ventricle, focal contusions of the anterior border of the upper lobe of the right lung, extensive through and through contusions and lacerations of the upper lobe of the left lung, approximately 900 cc of left hemothorax, bilateral pneumothoraces and pneumopericardium, and global atelectasis of the left lung.

There was a 1.2 x 0.9 cm laceration of the skin of the lateral left thoracic back located 37 cm below the level of the top of the head and 12 cm left of the posterior midline. There were no marginal abrasions, soot deposits or powder stippling.

c. Recovery of the bullet:

A deformed jacked bullet was recovered embedded in the subcutaneous tissues of the lateral left thoracic back.

d. Trajectory of the bullet:

The direction of the bullet was backward, upward, and leftward.

II. Gunshot Wound of the Right Thigh [Bullet Recovered]

a. Gunshot wound of entrance[9]:

There was a 1.0 cm in diameter circular perforating wound in the anterior proximal right thigh located 103 cm below the level of the top of the head, and 3.5 cm left of the anterior midline of the thigh. There were 1.0 cm in width circumferential red-pink marginal and muzzle abrasions with soot deposits in the depths of the margins of the wound, and a 1.2 x 0.6 cm red-pink recoil spring abrasion in the 3:00 o'clock position of the wound abutting the marginal and muzzle abrasions[10,11,12,13]. There was no powder stippling.

b. Pathway of the bullet:

The bullet perforated, contused, and lacerated the skin and soft tissues of the anterior, proximal right thigh, perforated, and fractured the proximal right femur, perforated, contused, and lacerated the soft tissues of the posterior, proximal right thigh where it came to settle.

Accompanying the track of the bullet were soft tissue hemorrhages and a displaced fracture of the proximal diaphysis of the right femur.

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[9] The autopsy report erroneously stated that there were no marginal soot deposits or powder stippling. This is patently false. The autopsy pictures vividly show circumferential marginal and muzzle abrasions, soot deposits in the depths of the margins of the wound and a recoil spring abrasion, without stipple abrasions.

[10] Autopsy Image # 2020-01904202003230710490010 14

[11] Autopsy Image # 2020-01904202003231255520010 06

[12] Autopsy Image # 2020-01904202003231255520010 07

[13] Autopsy Image # 2020-01904202003231258030010 01

c. Recovery of the fragmented bullet:
Multiple randomly situated jacketed fragments of a bullet were recovered embedded in the soft tissues of the proximal right thigh.

d. Trajectory of the bullet:
The direction of the bullet was backward, downward, leftward.

III. Blunt Force Trauma of the Head and Face, Neck, Trunk, and Extremities

1. There were clustered multiple red-pink punctate and curvilinear abrasions and contusions of the right anterior forehead each measuring from 0.3 to 4.2 cm in length by 0.2 to 0.4 cm in width.
2. There were clustered and randomly situated red-pink abrasions and contusions of the right zygomatic and lateral cheek measuring from 0.2 cm to 0.9 cm in greatest dimension.
3. There were multiple scattered red-pink punctate abrasions of the dorsal bridge and apex of the nose.
4. There was a 0.2 x 0.1 cm red-pink abrasion of the left pinna.
5. There was a 1.0 x 0.2 cm red-pink linear abrasion of the lateral rostral left neck.
6. There were two clustered, multiple punctate abrasions of the left thoracic and left lumbar back measuring 9 x 2 cm and 20 x 3 cm in aggregate, respectively.
7. There was a 0.3 x 0.2 cm red-pink abrasion of the dorsal proximal right middle finger.
8. There was a 0.5 x 0.3 cm red-pink abrasion of the posterior right elbow.
9. There was a 0.2 x 0.2 cm red-pink abrasion of the distal right knee.
10. There were multiple red-pink abrasions of the left knee measuring from 0.3 cm to 0.7 cm in greatest dimension.

The brain weighed 1460 grams and showed diffuse cerebral parenchymal edema and congestive brain swelling, with expansion and flattening of the gyri and narrowing of the sulci. There were no epidural, subdural or subarachnoidal hemorrhages. The heart weighed 270 grams. The coronary arteries did not reveal any significant atherosclerosis. The walls of the ventricles were not hypertrophied. The right and left lungs weighed 685 grams and 255 grams, respectively. The lung parenchyma showed pulmonary congestion and edema. The urinary bladder contained approximately 480 cc of urine.

Microscopic examination of the tissue histology slides of the heart, lungs, liver, kidneys, and brain allegedly revealed no significant histopathologic findings in the brain sections. The sections of the heart showed mild perivascular fibrosis. The lung sections showed parenchymal contusions and lacerations, with scattered intra-alveolar macrophages and focal chronic interstitial inflammation. There was scattered anthracosis with vascular congestion. The sections of the liver showed mild patchy predominantly macrovesicular steatosis, with focal chronic periportal inflammation. The sections of the kidneys revealed focal chronic interstitial inflammation.

Toxicologic screening of the urine sample at autopsy was negative. Toxicologic analysis of the autopsy chest cavity blood sample by NMS Labs, Horsham, Pennsylvania was negative.

Medico-Legal Questions

1. What were the bullet wound characteristics and bullet trajectories of the gunshot wounds sustained by Charles Lorentz?
a. What was the body positioning of Charles Lorentz at the time of the shooting?

In summary Charles Lorentz suffered the following evidence of trauma, documented at autopsy:

I. Gunshot Wound of the Left Chest [Bullet Recovered]
- a. Gunshot wound of entrance[14]: left and medial anterior chest
  1. Circumferential marginal abrasions and soot deposits
  2. Sparse circumferential stipple abrasions in the outer circumference of the soot deposits and marginal abrasions[15,16,17,18].
- b. Pathway of the bullet:
  1. Perforation, contusion and laceration, skin, and soft tissues of the left medial chest
  2. Perforation and fracture, anterior left 4th costal cartilage
  3. Perforation, contusion and laceration, anterior mediastinum, and pericardium
  4. Perforation, contusion, and laceration, through and through, anterior right ventricle, interventricular septum, and left ventricle
  5. Perforation, contusion and laceration, lateral left pericardium
  6. Perforation, contusion and laceration, medial left pleura
  7. Perforation, contusion and laceration, upper lobe of the left lung, through and through
  8. Perforation, contusion, and laceration, left posterior parietal and visceral pleura
  9. Perforation and fracture, posterior left 6th rib
  10. Perforation, contusion and laceration, soft tissues in the scapular fossa of the left scapular
  11. Perforation and fracture, body of the scapula
  12. Perforation, contusion and laceration, soft tissues of the infraspinous fossa of the left scapula
  13. Perforation, contusion and laceration, soft tissues of the lateral left thoracic back
  14. Penetration, contusion and laceration, subcutaneous tissues, and skin of the lateral left thoracic back
  15. Extensive soft tissues hemorrhages, anterior mediastinum
  16. Transmural contusions and lacerations, basal anterior right ventricle, interventricular septum, and left ventricle
  17. Focal contusions of the anterior border of the upper lobe of the right lung
  18. Extensive through and through contusions and lacerations, upper lobe of left lung
  19. Hemothorax, left, approximately 900 cc
  20. Pneumothoraces, and pneumopericardium, bilateral

[14] The autopsy report erroneously stated that there were no marginal soot deposits or powder stippling. This is patently false. The autopsy pictures vividly show circumferential marginal abrasions, soot deposits and stipple abrasions.
[15] Autopsy Image # 2020-01904202003231255520010 04
[16] Autopsy Image # 2020-01904202003231255520010 05
[17] Autopsy Image # 2020-01904202003231257140010 08
[18] Autopsy Image # 2020-01904202003231258030010 03

21. Global atelectasis of the left lung
22. Laceration of the skin of the lateral left thoracic back[19]

c. Recovery of the bullet: subcutaneous tissues of the lateral left thoracic back.
d. Trajectory of the bullet: backward, upward, and leftward

II. Gunshot Wound of the Right Thigh [Bullet Recovered]
a. Gunshot wound of entrance[20]: anterior proximal right thigh
1. Circumferential marginal and muzzle abrasions
2. Soot deposits in the depths of the margins of the wound
3. Recoil spring abrasion, 3:00 o'clock position of the wound
4. No powder stippling[21,22,23,24]
b. Pathway of the bullet:
1. Perforation, contusion and laceration, skin, and soft tissues of the anterior, proximal right thigh
2. Perforation and fracture, proximal right femur
3. Perforation, contusion and laceration, soft tissues of the posterior, proximal right thigh
4. Soft tissue hemorrhages
5. Displaced fracture, proximal diaphysis of the right femur
c. Recovery of the fragmented bullet: soft tissues of the proximal right thigh
d. Trajectory of the bullet: backward, downward, leftward

III. Blunt Force Trauma of the Head and Face, Neck, Trunk, and Extremities
a. Clustered multiple punctate and curvilinear abrasions and contusions, right anterior forehead
b. Clustered and randomly situated abrasions and contusions, right zygomatic and lateral cheek
c. Multiple scattered punctate abrasions, dorsal bridge, and apex of the nose
d. Abrasion of the left pinna
e. Linear abrasion of the lateral rostral left neck
f. Clustered, multiple punctate abrasions, left thoracic and left lumbar back
g. Abrasion of the dorsal proximal right middle finger
h. Abrasion of the posterior right elbow
i. Abrasion of the distal right knee
j. Multiple abrasions of the left knee

[19] This was a partial exit wound
[20] The autopsy report erroneously stated that there were no marginal soot deposits or powder stippling. This is patently false. The autopsy pictures vividly show circumferential marginal and muzzle abrasions, soot deposits in the depths of the margins of the wound and a recoil spring abrasion, without stipple abrasions.
[21] Autopsy Image # 2020-01904202003230710490010 14
[22] Autopsy Image # 2020-01904202003231255520010 06
[23] Autopsy Image # 2020-01904202003231255520010 07
[24] Autopsy Image # 2020-01904202003231258030010 01

It is a generally accepted principle and common knowledge in medicine and forensic pathology, that specific traumatic events generate predictable, reproducible, and specific patterns of traumas and injuries. Applying the clinico-pathologic method of differential diagnosis, a specific documented pattern of trauma can be evaluated, translated, and applied to the determination of the mechanisms of generation, causation, and sustenance of the specified trauma pattern, with a reasonable degree of medical and scientific certainty. This is based on the established common knowledge and generally accepted principles of trauma patterns and their mechanisms of generation, causation, and sustenance.

The patterns of injuries generated by gunshots, firearms and ballistics weapons, and the mechanisms of generation, causation, and sustenance of these patterns of injuries are very well-established in the medical literature and are common knowledge. Based on the prevailing forensic scenario, and on the generally accepted principles and common knowledge of medicine and science, and based on the global constellation, configuration and anatomic conformation of the gunshot wounds sustained by Charles Lorentz, the mechanism of generation, causation and sustenance of his fatal injuries can be determined with a reasonable degree of medical certainty.

The gunshot wound of entrance in Charles Lorentz's chest, as has been well-documented by the autopsy exhibited a circular configuration, with circumferential marginal abrasions, soot deposits and powder stippling, without any eccentric accentuation. This pattern of documented trauma confirms that the gunshot wound of the chest sustained by Charles Lorentz was a close-range shot. This means that when the bullet was fired, the muzzle of the gun that fired the bullet was located within approximately 12 inches [1 foot] away from the chest. Given the relative symmetrical circumferential distribution of the marginal abrasions and soot deposits, the muzzle of the gun when the bullet was fired was located in front of the chest and closer to the 90 degree [perpendicular] axis.

The gunshot wound of entrance in Charles Lorentz's right thigh, as has been well-documented by the autopsy exhibited a circular configuration, with circumferential marginal and muzzle abrasions and circumferential soot deposits in the depths of the margins of the wound and eccentric recoil spring abrasion, without powder stippling or eccentric accentuation. This pattern of documented trauma confirms that the gunshot wound of the thigh sustained by Charles Lorentz was a contact wound. This means that when the bullet was fired, the muzzle of the gun that fired the bullet was in contact with the skin/ clothing. The muzzle was touching the skin/ clothing symmetrically and perpendicularly given the relative symmetrical circumferential distribution of the marginal and muzzle abrasions and soot deposits.

Based on the physical characteristics and physics of ballistics, partially burnt and hot residues of the gunpowder and soot travel behind the bullet when it exits the muzzle, and due to gravitational forces and the differential densities of the bullet, soot, and residues of gunpowder in the gravitational field, the bullet can travel longest, followed by the partially burnt gunpowder residues, which travel longer than soot. Soot will travel for about 1 foot, before it is pulled down by gravitational forces, and the partially burnt gunpowder residue will travel for about 2-3 feet before it is pulled down by gravitational forces. Therefore, if the muzzle of the gun is closer to the skin by less than 1 foot, you will expect to find marginal soot deposits around the gunshot wound of entrance. If the muzzle of the gun is closer to the skin by less than 2-3 feet, you will expect to find powder stippling around the gunshot wound of entrance. If the muzzle of the gun is located greater than 2-3 feet away from the skin, you will expect to find only marginal abrasions around the wound without soot deposits or powder stippling. If the muzzle of the gun is in contact with the skin symmetrically and circumferentially you will expect to find marginal

and muzzle abrasions with soot deposits in the depths of the margins of the wound, and an eccentric recoil-spring abrasion.

If there is an eccentric accentuation of the width of the marginal abrasion, and/or soot deposits, it may suggest that the muzzle of the gun was not located perpendicularly to the chest or thigh when it was fired, but rather located in the direction of the eccentric accentuation of the marginal abrasion and/or soot. In this case the muzzle of the gun was located perpendicularly or near-perpendicularly to the skin, which resulted in symmetrical circumferential marginal abrasions and soot deposits.

The anatomic pathways of the bullets inside the body are well enumerated above. Based on these anatomic pathways, the direction of travel of the bullet inside the body can be determined with a reasonable degree of medical and scientific certainty with the body disposed in the anatomic position in the three planes of nature.

The bullet that caused the gunshot wound of the chest traveled in a backward, upward, and leftward trajectory. This trajectory would be consistent with the gun located in front of Charles Lorentz, at a level inferior or below the level of the gunshot wound of entrance and slightly situated to the right of the gunshot wound of entrance.

Similarly, the bullet that caused the gunshot wound of the right thigh traveled in a backward, downward, and leftward trajectory. This trajectory would be consistent with the gun located in front of Charles Lorentz, at a level superior or above the level of the gunshot wound of entrance and slightly situated to the right of the gunshot wound of entrance.

These prevailing characteristics, conformations and configurations of the gunshot wounds will be more consistent with the forensic scenario whereby Charles Lorentz was laying on his back on the ground with the deputy on top of him and the gun he yielded being located in front of Charles Lorentz and slightly to his right. These prevailing characteristics, conformations and configurations of the gunshot wounds are grossly inconsistent with the forensic scenario whereby Charles Lorentz was the assailant attacking the Officer and overwhelming the officer or knocking the officer to the ground. It is less likely, improbable, implausible, and unreasonable that Charles Lorentz was standing in front of Officer Mitchell, when the shots were fired.

The fatal shot was the gunshot wound of the chest because the bullet perforated the chest and pleural cavities, contused and lacerated, through and through, the heart and the left lung, with massive bleeding and global atelectasis of the left lung. The primary and final mechanism of death, as the histology slides have confirmed was global hypoxic-ischemic brain injury.

2. Did Charles Lorentz experience conscious pain and suffering, and for how long?

It is a generally accepted principle and common knowledge in medicine and forensic pathology, that specific traumatic events generate predictable, reproducible, and specific patterns of traumas and injuries. The patterns of traumas/injuries generated by blunt force impacts, gunshots, firearms and ballistics weapons, and the mechanisms of sustenance of these patterns of traumas/injuries are very well-established in the medical literature and have become common knowledge.

to be impaired supply of oxygen and blood to the brain for a relatively long period. The established and generally accepted median or mean reference threshold time for irreversible hypoxic-ischemic brain damage to occur from bleeding is about 3-10 minutes or greater after class IV hemorrhage had been attained.

A fundamental cellular injury of the brain cell is the excitotoxic neuronal injury. Excitotoxic neuronal injury is the end-point and outcome of different types of brain injuries including hypoxic-ischemic brain injury. Excitotoxic brain injury is initiated by all forms of cellular and membrane injuries of the brain cell. Brain injury depresses adenosine triphosphate synthesis, with failure of ion pumps and irreversible membrane failure, rapid efflux of potassium ions and influx of sodium, calcium, and chloride ions, along with water [cytotoxic or cellular edema]. The energy-dependent excitotoxic amino-acid [glutamate and aspartate] uptake mechanisms in presynaptic nerve terminals and astrocytes result in extracellular accumulation of glutamate and/ or aspartate, and prolongation of the stimulation of the N-methyl-D-aspartate [NMDA], kainate and alpha-amino-3-hydroxy-5-methyl-4-isoxazole [AMPA] membrane receptors. Additional calcium and sodium ions then enter the neuron through open NMDA, kainate and AMPA receptor channels [mechanoporation]. Further disruption of cellular organelles and function ensues when proteases, calpains, endonucleases, phospholipases ad other catabolic enzymes are released. These changes in concert cause rapid cell death, which manifests as pyknosis, amphophilia and eosinophilia of neurons [red dead neurons]. The histologic sections of the brain of Charles Lorentz revealed excitotoxic neuronal brain injury.

In summary therefore, a novel, independent and mutually exclusive event occurred on March 21, 2020 whereby Charles Lorentz was shot by an officer. Mr. Lorentz suffered serious bodily harm and injury, which included perforation of the pleural cavities, contusions and lacerations of the heart, and the left lung. While Mr. Lorentz laid on the ground after he was shot, Officer Mitchell did not know the types of trauma Mr. Lorentz had suffered, whether they were lethal, or less lethal or non-lethal, and whether the trauma was treatable or non-treatable with timely medical and surgical intervention including CPR. Therefore, it may be concluded that Officer Mitchell willfully and knowingly left Mr. Lorentz alone and, on the ground, unattended as he slowly passed through the various phases of consciousness, loss of consciousness and eventual death over 19 minutes without rendering any definitive medical aid and CPR, until other officers arrived at the scene and began CPR. The failure to provide such humane care by the officer was a novel and independent and mutually exclusive factor that initiated a novel terminal chain of events that breached the contiguity of the pre-existing chain of events and contributed to sudden and unexpected death. The failure to provide such basic humane care can be interpreted to be a significant and substantial contributory factor to the death of Mr. Lorentz.

4. Was Officer Robert Mitchell repeatedly punched in the head, face, or body by Charles Lorentz before he shot Mr. Lorentz?

Examination of the pictures of Officer Mitchell's face and extremities taken after the shooting reveals an intact and reasonably unremarkable face without any forensically significant evidence of blunt force trauma of the face including abrasions, contusions, or lacerations. It is less likely therefore that Officer Mitchell was repeatedly punched on the face by Charles Lorentz. The video recording of the incident and shooting also confirms and is consistent with the prevailing evidentiary clinicopathologic findings in this case that Officer Mitchell was not punched or kicked repeatedly or violently by Charles Lorentz. A violent blow to the face will transfer kinetic energy directly to the face and cause blunt force traumatic damage to the skin and soft tissues

and skeleton of the face, which should immediately manifest as abrasions, contusions, and/or lacerations, and possibly fractures of the facial skeleton. Officer Mitchell's face did not exhibit any evidentiary blunt force trauma of his face and could not have been punched violently and repeatedly on the face by a 25-year-old adult man. Instead, the evidentiary autopsy findings in this case confirm that the deceased, Charles Lorentz, was the victim who sustained multiple blunt force traumas of his head, face, trunk, and extremities before he was shot.

The medical records of Officer Mitchell state that Officer Mitchell exhibited focal swelling of the left cheek and left jaw, but without any abrasion, contusion, laceration, or fracture, and was not in any acute distress. CT scan of the face revealed no blunt force trauma of the face with no fractures or soft tissue injury.

The pictures of Officer Mitchell also did not show any significant extravasation of blood or bleeding from any wound of the face and/or mouths and lips. The adult human head weighs only about 10 pounds but receives over 20-25% of the cardiac output because the brain is located inside the head and needs a very high ratio of blood supply when compared to other organs of the body. Because of this anatomic and physiologic fact, any wound of the head and/or face bleeds extensively when compared to the level of bleeding from similar wounds on other parts of the body. The picture of the deputy's head and face did not reveal such expected bleeding; therefore, it is less likely that he sustained any significant trauma of his face and head that would have caused any abrasion, contusion and/or laceration that would have bled extensively. Such expected abrasion, contusion and/or laceration would have been present if the officer was punched violently and repeatedly on the face and head. Officer Mitchell's neck, trunk, and extremities in the pictures, also did not show any evidence of any forensically significant blunt force trauma.

The prevailing evidentiary differential diagnosis in this case confirms that Charles Lorentz was the victim who sustained significant blunt force polytrauma of his body, in addition to gunshot wounds of his chest and right thigh. Officer Mitchell was the assailant who did not sustain any forensically significant blunt force trauma of his body, or any gunshot wound of his body.

5. Could the blunt force trauma on Charles Lorentz's face have been caused by impacts with the base of the handle of the taser gun?

It is a generally accepted principle and common knowledge in medicine and forensic pathology, that specific traumatic events generate predictable, reproducible, and specific patterns of traumas and injuries. Applying the clinico-pathologic method of differential diagnosis, a specific documented pattern of trauma can be evaluated, translated, and applied to the determination of the mechanisms of generation, causation, and sustenance of the specified trauma pattern, with a reasonable degree of medical and scientific certainty. This is based on the established common knowledge and generally accepted principles of trauma patterns and their mechanisms of generation, causation, and sustenance.

The patterns of injuries generated by blunt force impacts and the mechanisms of generation, causation, and sustenance of these patterns of injuries are very well-established in the medical literature and are common knowledge. Based on the prevailing forensic scenario, and on the generally accepted principles and common knowledge of medicine and science, and based on the global constellation, configuration and anatomic conformation of the facial blunt force traumas

sustained by Charles Lorentz, the mechanism of generation, causation and sustenance of his fatal injuries can be determined with a reasonable degree of medical certainty.

Examination of the abrasions and contusions of Charles Lorentz's face reveals clustered red-pink and red-purple curvilinear abrasions and contusions of the right forehead and right cheek. The curvilinear configurations of these abrasions and contusions appear consistent and compatible with the curvilinear configuration of the base of the handle of the taser gun used in this case. Abrasions and contusions of the human skin especially skin overlying bone and bony prominences like we have in the forehead and zygomatic cheek in this case, conform to the configurations of the impacting surface. In this instance therefore these curvilinear abrasions and contusions conform to the curvilinear configuration of the base of the handle of the taser gun.

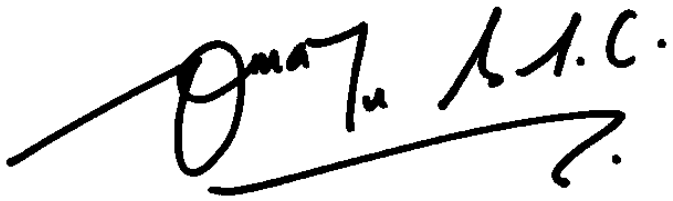
With a reasonable degree of medical certainty therefore, the base of the handle of the taser gun cannot be excluded as an implement used in part or in whole to inflict the abrasions and contusions on the right forehead and right cheek of Charles Lorentz.

I have provided all my opinions and conclusions with a reasonable degree of medical certainty.

I reserve the right to amend, supplement, revise and/or modify my opinions and report, up and to the time of trial, should additional information become available.

Thank you.

Very truly yours,



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